NON-PUBLIC?: N
ACCESSION #: 8903240157
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Byron, Unit 1 PAGE: 1 OF 3

DOCKET NUMBER: 05000454

TITLE: Main Generator Instability Trip Caused By Microwave Noise Resulting In A Reactor Trip
EVENT DATE: 08/04/88 LER #: 88-005-01 REPORT DATE: 03/15/89

OTHER FACILITIES INVOLVED: Byron Unit 2 DOCKET NUMBER: 05000455

OPERATING MODE: 1 POWER LEVEL: 098

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: T.Tulon, Assistant Superintendent Operating TELEPHONE: 815-234-5441 Ext 2213

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE TO NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

At 0047 on August 4, 1988, with Unit at 98 percent and Unit 2 at 95 percent reactor power, two stability trip enable annunciators actuated simultaneously in the Main Control Room and the "Unit Stability Generator Trip" annunciator actuated. The Unit 1 Main Generator output breakers opened automatically. The Main Turbine automatically tripped, as did the reactor. Following the reactor trip all steam generator levels rapidly decreased and both Auxiliary Feedwater Pumps automatically started. A post trip, expected Feedwater Isolation occurred. The licensed operators implemented the appropriate emergency operating procedures and Unit 1 achieved stable conditions in Hot Standby at 0120.

The Unit trip occurred due to a signal generated by the Unit Stability Trip System, which indicated that the electrical grid configuration could not distribute the power output of both Byron Units. The actual grid

configuration was correct and capable of distributing the power output, however, noise on the microwave circuit that communicates grid status to Byron Station yielded false indications. The false data satisfied the trip system coincidence and generated the automatic main generator trip.

Immediate corrective actions were taken to disable the Unit Stability Generator Trips and to restrict power output from Byron Station. Commonwealth Edison's Operational Analysis Department has replaced the single microwave channel with four separate channels. Also, additional security was installed in each channel to reduce the possibility of a false indication or interference causing a trip signal.

There have been no previous, similar occurrences of this event at Byron Station.

END OF ABSTRACT

A. PLANT CONDITIONS PRIOR TO EVENT:

Event Date/Time 8/4/88 / 0047

Unit 1 MODE 1 - Power Operation Rx Power 98%
RCS AB! Temperature/Pressure Normal Operating

Unit 2 MODE 1 - Power Operation Rx Power 95%
RCS AB! Temperature/Pressure Normal Operating

B. DESCRIPTION OF EVENT:

There were no systems or components inoperable at the beginning of the event that contributed to the event. At 0032 on August 4, 1988, with Unit 1 at 98 percent and Unit 2 at 95 percent reactor power, the "Line 15501 Line Open Stability Trip Enabled" and "Line 17101 Line Open Stability Trip Enabled" annunciators momentarily and independently alarmed in the Main Control Room and then reset. They alarmed nd reset independently again several times in the next 15 minutes. The annunciators warn of potential electrical grid instabilities that may occur when insufficient electrical distribution capacity is available to accommodate the operation of both Byron Units. The Unit Stability Trip System protects the Main Generator (EL) from electrical instability and subsequent Main Generator damage by initiating an automatic Unit 1 Main Generator trip, when the electrical grid alignment is adverse to two Unit operation. The licensed operators notified the Rock River Division Load Dispatcher of the intermittent alarms. The Load Dispatcher informed the control room operators that the

actual electrical grid configuration did not warrant the alarms, and initiated an investigation to determine the cause of the alarms.

At 0047 both line stability trip enable annunciators actuated simultaneously and the "Unit Stability Generator Trip" annunciator actuated. The Unit 1 Main Generator output breakers opened automatically. The Main Turbine TA! tripped automatically as designed, and since power was above the P-7 interlock (reactor or turbine power greater than 10 percent), the reactor automatically tripped. Following the reactor trip all steam generator levels rapidly decreased as expected, and both Auxiliary Feedwater Pumps (AFP) BA! started automatically due to ID Steam Generator low-low level. As average reactor coolant temperature (Tavg) was ramped to its no load value by the steam dumps with the reactor trip breakers open, an automatic Feedwater Isolation SJ! occurred. The licensed operators implemented "Reactor Trip or Safety Injection - Unit 1 Emergency Operating Procedure" (1BEP-0) and "Reactor Trip Response - Unit 1 Emergency Operating Procedure" (1BEP ES-0.1). During the performance of 1BEP ES-0.1 the Nuclear Station Operator (NSO) (licensed reactor operator) observed that a Main Feedwater Regulating Valve Bypass Valve (1FW530A) indicated dual position. An operator was dispatched to verify 1FW530A closed locally, which it was.

At 0053 the 1B AFP was stopped by the NSO, but it automatically started due to lowering steam generator levels at 0054. At 0058 the Feedwater Isolation signal was reset, the Startup Feedwater Pump was started, and feedwater flow was established from the Startup Feedwater Pump to all steam generators. At 0059 the 1B AFP was stopped and at 0116 the 1A AFP was stopped. Stable plant conditions were achieved in Hot Standby at 0120.

This Licensee Event Report (LER) is submitted in accordance with 10CFR50.73 (a)(2)(iv) due to the automatic Reactor Protection System JG! and Engineered Safety Feature (ESF) System actuations.

C. CAUSE OF EVENT:

The Unit 1 Main Generator output breakers automatically
pened due to a
signal from the Unit Stability Trip System, which indicated that the electrical grid configuration could not distribute the power output of both Byron Units. The actual grid configuration was correct and capable of distributing the power output, however, noise on the microwave circuit that communicates grid status to Byron Station yielded false indications. The false data received by Byron Station completed the coincidence

required to trip the Unit 1 Main Generator (i.e. lines 15501 and 17101 both unavailable). Commonwealth Edison's Operational Analysis Department (OAD) conducted an investigation of the event. No specific cause for the noise signals on the microwave circuit was discovered. Intermittent noise is not uncommon in microwave communication circuits, and the specific cause of the noise often does not persist long enough to be identified, as was the case during this event.

The bolts holding the actuation arm for 1FW530A position indication loosened and allowed the arm to separate from the valve stem. This caused the dual position indication in the Main Control Room.

D. SAFETY ANALYSIS:

Neither plant nor public safety were affected by this event. No actual component degradation existed to warrant the Unit trip. All safety systems responded as designed with the exception of the 1FW530A indication discrepancy, and there were no operational anomalies.

E. CORRECTIVE ACTIONS:

Immediate corrective actions were taken to disable the Unit Stability Generator Trips and to restrict power output from Byron Station until the microwave noise problem is resolved. Commonwealth Edison's OAD has installed a modification to the microwave communication circuit to prevent recurrence of this event. Initially, there was one microwave channel with four receivers. The new design has four microwave channels each having three receivers. Each group of three receivers acts as a unit for each microwave channel to produce a permissive trip output. If the monitoring provided by the receivers indicates no adverse conditions, an auxiliary relay is actuated to interact with the stability logic. This new design adds security to the system and reduces the possibility of a false signal or interference causing a unit trip. Subsequent to the modification, the power output restriction placed on Byron Station earlier was removed. The actuation arm for 1FW530A position indication was properly positioned and the locking nuts were tightened. The valve was stroked, proper operation was verified and the valve was returned to service on August 4, 1988.

F. PREVIOUS OCCURRENCES:

NONE

G. COMPONENT FAILURE DATA:

NONE

Commonwealth Edison
Byron Nuclear Station
4450 North German Church Road
Byron, Illinois 61010

March 15, 1989

Ltr: BYRON 89-0205

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Dear Sir:

The enclosed Licensee Event Report from Byron Generating Station is being transmitted to you as a supplemental report.

This report is number 88-005-01; Docket No. 50-454.

Sincerely,

R. Pleniewicz
Station Manager
Byron Nuclear Power Station

RP/dm

Enclosure: Licensee Event Report No. 88-005-01.

cc: A. Bert Davis, NRC Region III Administrator
P. Brochman, NRC Senior Resident Inspector
INPO Record Center
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